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Rail-Road News.

Railway Accidents Prevented.

Fasten on the bottom of the cars, near the wheels, pieces of wood, to be about six inches above the rails, so that when the axles or wheels break, these projections will reach and drag on the rails, and aid the breaks in stopping the train. These pieces of wood may have a notch embracing the inner side of the rail, and thus effectually prevent the cars from leaving the track. W. F.

Boston, March 27, 1851.

Mobile and Ohio Railroad.

The agent appointed by the Governor of Alabama to select and locate the lands in that State, appropriated for the Mobile and Ohio Railroad, has completed that duty. About 253,440 acres, or 396 sections, have been selected. Most of the selected lands lie contiguously to the waters of Mobile Bay. The lands are said to be worth an average of three dollars per acre.

Coal in Road Engines.

The Dimpfel Anthracite Coal Locomotive, which has been in use on our road for some months, is the fastest engine on the line. With 3¼ tons of coal it does the work that in other engines consumed 9 cords of wood! This engine is about to work a complete revolution in the use of our coal, and in the economic value of propulsion in land and water.—[Pottsville Register.

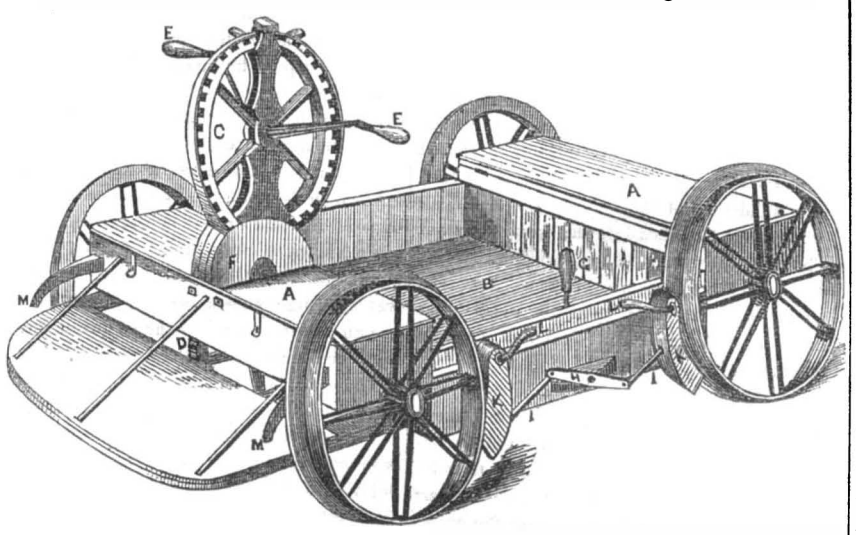
[We are glad to hear of the continued succes of this locomotive. It is to be hoped that Mr. Dimpfel's improvements will be soon adopted on all locomotives and in all marine engines.

Queenston Suspension Bridge.

The Queenston Suspension Bridge, in presence of a great number of spectators, was opened on Wednesday the 19th ult. A correspondent to the Tribune says, "it is the largest bridge in the world, being 1,000 feet in length. It cost $50,000. A large number of persons from Toronto were present, and the occasion was celebrated by a festival prepared under the superintendence of Mr. Wynn." Mr. Edward W. Serrell, C. E., of this city, is the engineer of this bridge. We must say that he has not been slow in erecting it. Some time ago, in noticing an extract from another paper, we made a comparison between this bridge and the one at Wheeling. We stated that there must have been a mistake, somewhere in the article, and we suppose that many such have been promulgated, but *we* will no doubt have a correct description of this noble bridge at some future day. Mr. Serrell is an accomplished and able engineer.

The Mayor of our city employs boys to go about the streets with the following placards, "Strangers beware of Mock Auctions."

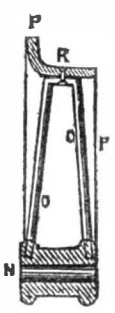
IMPROVED RAILROAD HAND-CAR---Figure 1.



The improvement on this Car is the invention of Mr. F. M. Mattice, of Buffalo, N. Y. Fig. 1 is a perspective view, and fig. 2 is a vertical transverse section of the wheel, showing how the rods or arms are attached and secured to the same.

Hand-cars for railroads are very important vehicles. The duties they have to perform require a peculiar construction, and an adaptability of parts to enable them to perform successfully and well. They should be strong and light at the same time, and they should be constructed in such a way that their velocity can be arrested in the shortest possible period of time. When a train is coming in any direction, it is required that the speed of the hand car should be instantly arrested, and the vehicle taken off the track. A good brake is necessary to accomplish the first object, and a light car will facilitate the second. Both of these qualities, it is believed, are embraced in this car.

FIG. 2.



A A, fig. 1, are tool boxes in the car; B is the bottom of the large receptacle of the car; C is a cog wheel, and E E are the handles by which the men drive it. There is a band of iron around the wheel to protect the teeth; F is a flange post (one on each side), and between which is a cog-wheel gearing into C; D is another cog-wheel on the wheel axle, gearing into the intermediate. By this gearing any required speed may be given to the car; M M are handles to lift the car; K K are two brakes attached by rods, I I, to the beam leg, H. L L are two brackets to steady and guide the brakes; G is the lever to operate the brakes at once. By pulling on the lever, G, to the right, the beam, H, will be thrown more to the perpendicular on its axis, and the brakes will be thrown from the face of the wheel. By pulling on the lever to the left, the beam, H, will be thrown more to the horizontal and the brakes projected against the face of the wheels.

In figure 2, P P represent the rim of the wheel, made in the usual form. O O are wrought-iron rods bent over at the top, their ends are inserted into the hub, N, the hub being cast, thus embracing the end of the said rods. The rim is shrunk on the rods, the ends of which are formed in a very excellent manner to constitute a seat for the said rim. The rods are united to the rim by a rivet, R, a hole being directed to receive the said rivet. By this mode of making the wheel, one of great strength and lightness can be constructed, and this is the grand desideratum. More information may be obtained from Mr. Mattice.

British Railroad through Canada to the Pacific.

Mr. Whitney, one of the projectors of a railroad to the Pacific, has gone to England, it is said, to confer with the British Government about constructing a railroad through the British North American Possessions to the Pacific. It is well known that Mr. Whitney has expended a great deal of money on this favorite subject of his, and he travelled through every state of the Union, in order to render his project popular. A majority of our State Legislatures passed resolutions favorable to such a railroad, and a committee of the House of Representatives at Washington reported in favor of his plan. It never met with much favor in the Senate, and we suppose Mr. Whitney has become tired and discouraged of ever carrying through his project and receiving a grant of 60 miles wide, and 2,000 long of lands to build his Pacific railroad. Whether he will succeed in England or not, is a question. There is plenty of gold in England, but it is such a short time since railway speculations played such pranks in the money markets there, that every new project of a kindred nature is now viewed with very circumspect notions of its payability. A railroad through Canada, extending from Halifax and through the country to the Pacific, could be built for as little money as one in the United States, but how could the road be made to pay. If those who invest money in such a road could wait for returns for about ten or fifteen years, and those very small at that, a considerable trade might be nurtured in that time for China, but railroads through Canada could never enable traders to carry goods from China, so cheap as by sailing vessels; neither can one through the United States. The coal of Vancouver's Island, however, is something which will yet be of great advantage to Canada.

Discovery of Ancient Manuscripts at Rome.

It is announced that a discovery has been made at Rome, of twenty-five volumes, devoted to descriptions of the territory of the United States. These volumes are in the library of the Dominican friars, and our government will unquestionably deem the subject of sufficient importance to procure copies of works so rare and so useful.

It is likely to prove an illusion however, like a great number of other wonderful discoveries these days.

English and American Patents.

"As regards light dues, it is unnecesary to add anything to the statement given above, by which we are glad to see that the attention of the Government has been drawn to the enormous inequality of the present system. We trust it will not be long before their attention will be in like manner drawn to the inequality existing under the patent laws. An Englishman arrives here, and in a few days may obtain, at almost nominal cost, a patent for the whole Union; but let an American visit London for the same purpose, and he is delayed for weeks by the necessity for obtaining the signatures and seals of a host of placemen, who live out of the taxation thus imposed, and at the close he finds he is taxed to the extent of a hundred or more pounds for England alone; and that if he desires to include Scotland and Ireland, his expenses of time and money must be doubled, if not even trebled.—[Washington Republic.

The above is an extract from an editorial of the "Republic." The remarks are made in speaking of the correspondence between our Minister and Lord Palmerston, about the tax on ships to support the coast lights of Britain. The tax is a bad one, to be sure, and should be changed as suggested by Mr. Lawrence, but we do not think the Republic states the case correctly about the British Patent Laws. The English patent fee is high, but it is as high for John Bull as Brother Jonathan. In our country it is different. We charge an Englishman $500 for a patent fee—all other foreigners $300, an American citizen $30. In England an American will get a patent in about two months. In our country we have known an Englishman pay $500, apply for a patent at Washington, and not get it for eight months. There is no irregularity in the English patent laws, but there is in ours. The comparison of the Republic is an unfortunate one—inapplicable. If it had said the charges were exorbitantly high, it would have stated the plain truth. The English patent fees are high, far too high, and the sooner the price is reduced so much the better, but there is no inequality about them,—the Hindoo and the Englishman are placed on the same footing and are judged by the same law. We suppose that many of our people are not aware of this fact, but have supposed, that Americans paid higher patent fees in England than the natives. The rules of the English Patent Office, we think, are nonsensical, but they are more injurious to the people of England than to foreigners.

Iron Ships.

The British Government have issued orders stating that no contract will be entered into with iron ships.

The Mississippi river is again so high as to threaten a disastrous overflow. Considerable property has already been destroyed at various points, and much farther damage was apprehended at the last accounts.

Among the objects of the Swiss collection for the London Exhibition is a gold pen-holder with a diminutive watch at the end of it, indicating not only the hour and minutes, but even the day of the month.

Such is the quantity of glass used in the building for the exhibition, that, if the duty had not been remitted, it would have amounted to $200,000.

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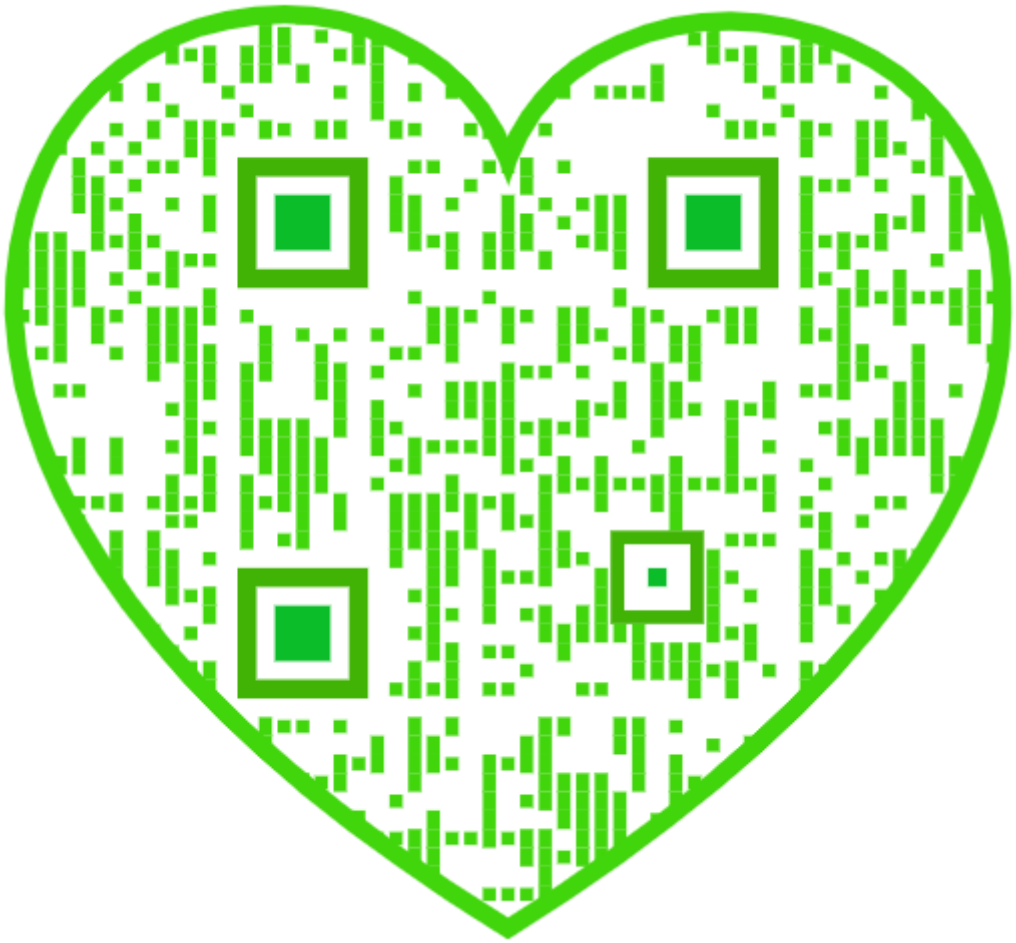

Miscellaneous.

Foreign Correspondence.

LONDON, 14th March, 1851.

The Crystal Palace exhibits a scene, every day, of great interest and excitement. The packages of British articles, and those of other nations which have arrived in London already, are neither few nor far between. Another test of the strength of the galleries has taken place, whereby every square foot was tested with the rolling weight of 100 lbs.: There was not the least sensible vibration. The corps of sappers and miners belonging to the army, attend to the unloading and arranging of bales. They are a very expert set of soldiers, being mostly all able machinists, carpenters, &c., and are educated and ingenious.

The Commissioners of the Exhibition have appointed thirty juries—one for each section. There are to be 270 jurors—135 of them to belong to other nations than England. If any exhibitor accepts the office of juror, he then ceases to contend for a prize. The juries are to commence their duties on Monday the 12th of May. Each jury is to consist of about an equal number of foreigners and British subjects. The Commissioners are decidedly of opinion that medals should be awarded for articles of merit upon their individual merit, without the competition question, and indépendent of the degree of merit as standing in competition with other articles. The juries are empowered to take evidence and call in adventitious aid. The Royal Agricultural Society is to test the merits and decide upon the agricultural implements. When the Commissioners are not sitting, all important business is to come before Prince Albert. The gentlemen under whom the whole management is placed, are men of celebrity, and some of them of world-wide fame.

One article in the shape of a smoke damper and fire extinguisher, has come up from Liverpool, and is worthy of attention in the United States. It is intended to be built in the chimney of every house, and consists of a chimney arch, bevelled inwards and upwards, to receive a wedge-shape brick arching, thus allowing the cold air of the apartment to mingle gradually with the heated air in the chimney; a frame is attached to this, determining the size of the mouth of the chimney; from this frame spring two supporters of the frame of the damper, which can be put in and taken out at pleasure; and, as these supporters guide the brick-setter, they secure those gradual contractions in forming the throat so essential to a good going chimney. The second modification is contrived to obtain those gradual contractions which may have been neglected at first. A frame-work is prepared as above, for fixing in, determining the size of the mouth, and carrying the supporters for the damper, which are to be built up behind, and rendered as effectual as if done at first. A small rod at the back of the grate, connected with a chain passing over a pulley, and moved two inches, regulates the damper to the full size of the chimney, or renders it perfectly tight, thus effectually stopping all back smoke when no fires are used, and, by shutting it, in case of the chimney being on fire, will speedily extinguish it. Everything is important that adds to domestic comfort; and surely it is no little relief to get quit of a smoky chimney.

The Crystal Palace viewed by moonlight is a most imposing structure. The glitter of the moons pale beams on the glass sides of the building, set off by the graceful and ornamented shadows of the arched iron work, impresses the mind with feelings which carry the imagination to some vast oriental palace far away in a sunny clime. EXCELSIOR.

A Barn of Glass.

An English farmer intends to cover a large barn, 110 feet long, 28 feet wide, at his farm, at Heavitree, with a glass roof, after the model of the palace of glass. The expense will not be over two-thirds of the cost of slate, and he anticipates several advantages from the novel roof: among others, it may be applied to the drying of corn during a wet harvest.

Human Life at the East vs. Human Life at the West.

The Economist published at Cannelton, Indiana, has a very excellent article upon the subject set forth in the above caption. It speaks of the feelings of the people at the East in reference to the supposed fate of the Atlantic, and the joy that was manifested at her safety, and then it says:—

"On the morning of January 27th, or one month after the sailing of the Atlantic, an inland steamer was ascending the Mississippi river, bearing on board more than two hundred souls. The darkness of night had not yet been interrupted by the breaking of day. Onward the steamer kept its way, steaming with giant power the rolling of the "Father of Waters." Not a note of danger was breathed—no one saw the angel of death flapping his dismal and shadowy wings over the ill-fated vessel. But the unseen hand of destruction at last gave the blow, and in an instant more then one hhndred and thirty unfortunate human beings were launched into the great hereafter. The muddy waters of the inrushing stream drowned even the death-shrieks of those who awoke only to enter upon the sleep "that knows no waking." That boat was the John Adams.

Yet where have been heard the expressions of sympathy, anxiety, and regret, such as were called forth by the circumstances connected with the Atlantic? Where that intense excitement which indicates the deepest feelings of our nature? Alas, with the waves that closed the dying, almost subsided every thought or care for those who perished. Death snatches his victims by scores and hundreds upon our Western waters, and yet his bloody fingers alarm not those who can stay his ravages

Ye men of the West, how many hecatombs of hnman beings will ye offer up to appease the appetite of the Destroyer?

But is not human life not as valuable at the West as at the East? Are not the affections and the social qualities of persons here, of the same kind and value with those at the East? Are not parents and children, brothers and sisters, bound together here by the same cords of love that unite them there? Why then this difference between regret for calamities here, and calamities there?"

Novel Ice Explosion on Lake Champlain.

An extraordinary disruption of ice, according to a well authenticated account lately published in the Burlington Free Press, occurred in the solid and before unbroken field of ice in Champlain, near Alburgh, during the night of the 16th of February, 1851.

On that morning a hole or break in the ice of five or six rods in extent each way, was discovered by M. F. Mott, an intelligent gentleman residing on the shore, who, proceeding to the spot, found the broken space filled wiih pieces of ice; while at distances of seven and ten rods, out on the unbroken field, lay two large solid floes or blocks of ice, seventeen inches in thickness, and measuring from two to three rods in width, the largest being estimated to weigh more than twenty tons.

The explosive force which thus threw these immense floes of solid ice from their beds to distances varying from one to nearly two hundred feet, must have been tremendous, equaling that of many barrels of gunpowder.

It seems there had been a voilent wind on the night in which the event is supposed to have transpired, which, after blowing from the South during the evening before, suddenly veered and blew in a fierce squall from the West. And we can think of no other more satisfactory solution of the mystery, than that it was occasioned by the confined air which was driven by the force of the wind in under the ice at some more or less distant crack or open glade, and forced forward by the first impulse and the undulations of the main body of the ice, till reaching this spot near the shore that prevented its expansion, it became compressed to such a degree as to occasion the explosion in question.

Be that is it may, however, the incident constitutes an interesting phenomenon connected with the ice in that lake, and is well worthy of scientific investigation. Will the editor of the Scientific American give us his opinion of the remarkable occurrence?—[Greene Mountain Freeman.

[Our contemporary offers the only reasonable solution of this phenomenon. It is well known that confined air frequently splits up the ice on our nothern lakes in cracks a number of feet wide and miles in length. The sound of the rending of the ice is like that of the rolling of distant chariots and is heard at the distance of many miles.

Bad Water, and the Western Fever.

A correspondent writing to us from the western part of this State, says he has lately been devoting some time to the study of the causes of fever in the western parts of our country. The first inquiry he made was, "what substances are contained in the waters at the West that render them so unhealthy?" And what substances would purify it? He believes that the prevailing substance is ammonia, which is produced by the decomposition of vegetable and animal substances, and is a gas that water will absorb in considerable quantities. He believes that filtering the water through substances for which the gas has an affinity, would be the means of purifying it and making it healthy.

There can be no doubt of the fact that bad water is the fruitful cause of many diseases. It has generally been remarked that the people who inhabit districts, where the water is pure, enjoy good health, and exhibit the same in their countenances. There can be no doubt that water containing ammonia is injurious to health. In the East Indies it is customary to boil the water intended for drinking, and then expose it to the atmosphere until it cools. The ammonia, being very volatile, is expelled by boiling. Lime is an absorbent of ammonia, and so is plaster of paris and charcoal. It is wonderful how small a quantity of any deleterious matter, in food or water, causes disease; but the atmosphere is as often, if not oftener, the elerr ent whereby disease is communicated to the frame. Were we living in the West, and suspected that the water we used contained deleterious substances, we would filter it through sand and clay, and perhaps some charcoal. The charcoal, unless employed as the upper layer, carries down some of its particles and discolors the water, but this can easily be prevented, and the water will appear like crystal. Filtered water should always be dropped from some height and exposed to the air before it is drank; this is to absorb air, for, without air, it has a rain-watery taste. We believe that too little attention is paid to the purifying of the water that is used for cooking and drinking; and were more attention paid to the purifying of it, some places that are now famous for some diseases, would soon know nothing about them but as things that were.

A Patent Claim.

MESSRS. EDITORS—In your notice of my disclaimer, in your paper of the 22nd inst., you state that it is one of the most extensive that has come within your notice, and that the papers were originally surely made out with a great disregard to correctness, &c. A word of explanation would seem to be due to the solicitor who drew the papers, as well as to myself.

Attached to my specifications are two drawings, the one being a colored drawing representing the machine and several parts arranged for operation, upon this drawing are represented, or partially represented, the several things disclaimed. The wheel, figure 8, the *invention* of which is disclaimed, is a modified form of the machine, which may be used instead of the present arrangement mentioned in the specifications, you will observe that I do not disclaim the arrangement when thus used, but simply the invention of the wheel. The collar, with sliding tooth, cord pulley, and treddle, are partially represented on this colored drawing, but they are not referred to in any manner in the specifications of my patent, nor do they, as I believe, form any part of it.

The other drawing, and the one to which the specifications mainly refer, is a lineal drawing, and neither of the things disclaimed are represented thereon, but only so much of the machine as is my invention; it is proper also to add that there is not a single word in the claim of my patent referring in any manner to the several things disclaimed, nor do I think such an inference could be drawn from the claim or specifications, and I do not think that a disclaimer was at all necessary, but as it was supposed by some that such a construction might possibly be put upon them, I was induced, for greater caution, and to guard against misconstruction and mistake, to disclaim the matters, although I thought it wholly unnecessary. Please set the matter right in your valuable journal, and oblige,

A. J. WILLIAMS.

Utica, March 24th, 1851.

[Friend Williams would see that our comments were made in no unfriendly spirit. We are glad to see such an explanation of the matter, and we believe that Mr. Williams will now consider that we have done a good act in drawing it out.

Geological Discovery.

The following interesting geological discovery has just been made by General Cullen at Cochin:—A question having been raised as to the relative positions of that most mysterious of rocks, laterite, and the shell limestone on which in this quarter it was said to rest, General Cullen caused a well to be dug from the top of the cliff, about 40 feet above the level of the sea, downwards to this depth; it was about 80 feet inland At the depth of 37½ feet he came to shell limestone—a well sunk near the sea 84 miles to the south-west gives precisely the same results. The limestone is one of the most modern of our formations. The shells contained in it seem all recent—the lignite and fossil remains are close by. The supposition that the laterite is nothing else than decomposed granite, or trap *in situ*, is thus completely and at once disposed of; by knowing what it is not, we may by-and-bye be led to infer what it is. It is not every one who is in a position to dig a well 40 feet deep through a solid rock to ascertain the relation of two sets of strata.

The Dry Dock at Pensacola.

The floating Dry Dock, constructed by Gilbert & Secor, on the Balance plan, at the Pensacola Navy Yard, was launched on the 19th March, without the slightest accident. This dock is capable of receiving a steamship of 6,400 tons or double the tonnage of the Collins' ships. Its dimensions are, length 350 width 105 feet.

A very ancient ship was found, a month ago, in the old port of Jaffa, in Syria. It is calculated that this wreck, which is, nevertheless, in a very excellent condition, is one of the ancient galleys of the country when it was governed by the Romans. A Dr. Johnson, who was present when this curiosity was discovered, obtained from the government consent to have it taken to London. Perhaps it will be seen at the exhibition.

The Late Hungarian General Bem.

At a public sale held at Alleppo on the 22d of January of a portion of Bem's effects considerable anxiety to obtain *souvenirs* of the late general. An odd cotton sock, worth 4d., sold for $1; a cotton coat, worth 25s., sold for $12; a pair of fur-lined inexpressibles, worth 30s., sold for $30.

Capt. Henry Shreve, the early steam navigator of the Mississippi, died at St. Louis on the 7th inst. He commenced flat-boating in 1808, and in 1814 took charge of a steamboat, the third built on the Western waters. He was the man who broke up the Livingston and Fulton western monopoly. He was the inventor of the Steam Snag Boat.

The Morning Post says that unhappy Londoners positively live on shams and delusions. "Our milk contains everything but milk, our bread is we know not what, our water full of fighting devils of most ferocious aspect, our white pepper consists chiefly of ground rice, and our black of iron filings and the sweepings of the Custom-House floors, and the component parts of coffee are chicory, burned beans, and roasted wheat, colored with burned molasses."

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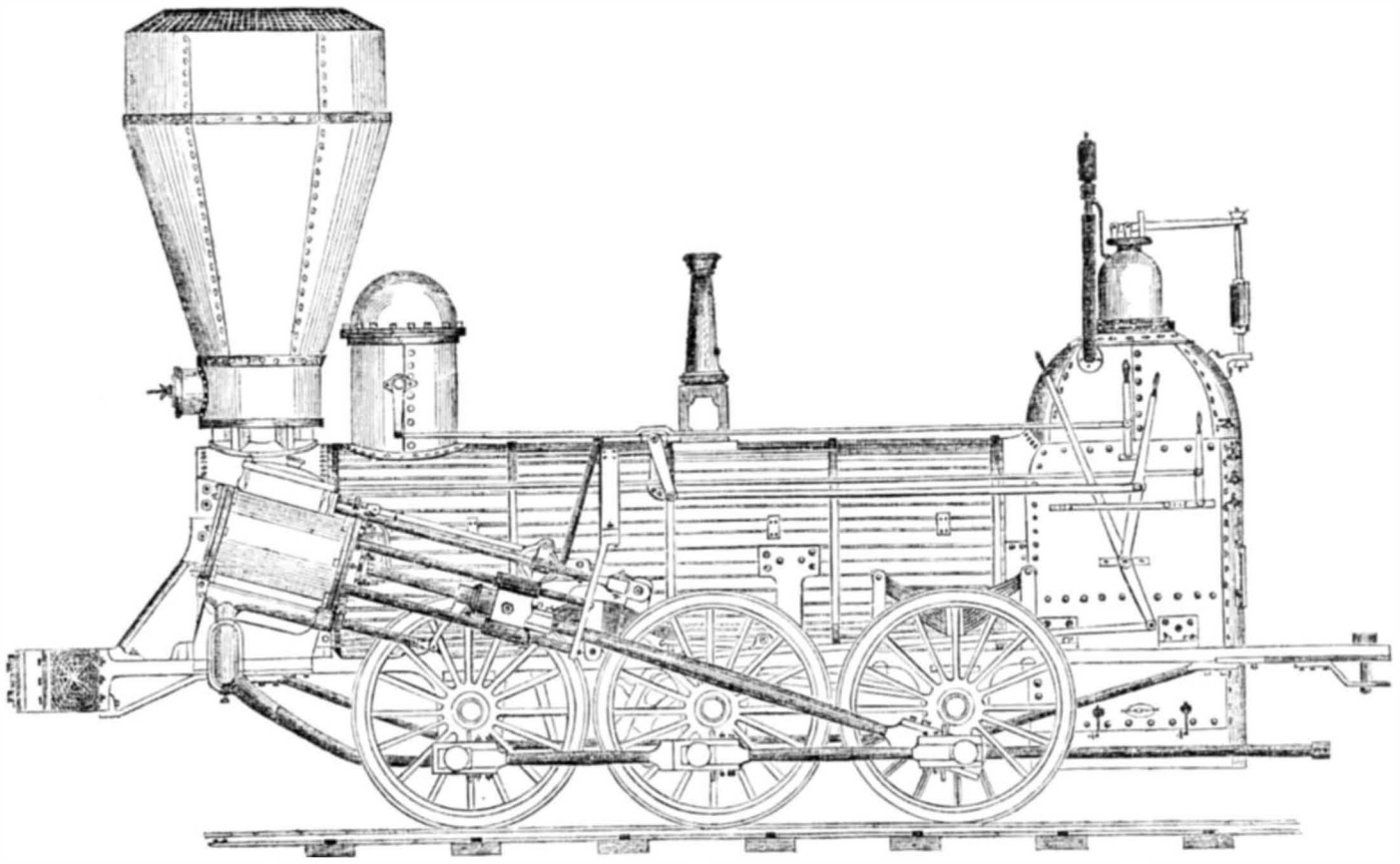
THE AMERICAN WOOD-BURNING LOCOMOTIVE.



The locomotive is the most perfect of machines. It approaches nearer to the spiritual and physical combination of the human machine, than any other. In it we behold what the steam-engine is when "unchained to the rock, and unfettered to the soil.

The accompanying engraving is a side elevation of an American wood-burning locomotive, the kind which is in general use in our country, with the levers represented by the engraver at the left hand side. The locomotive may be said to be two high pressure engines, with a boiler mounted on a carriage, the driving wheels of which are yoked, by crank-pins, to the connecting rods of the pistons in the cylinders, which receive a reciprocating motion by the steam being let in and out alternately by valves at both ends of the cylinders under the covers, and thus communicating a rotary motion to the wheels, impelling itself and its huge train forward on the railroad with a velocity surpassing that of the eagle in his aerial flight. Both sides of the locomotive are nearly alike. The side represented in the engraving exhibits all the parts on the other side; nothing is left out, as this side shows the shifting levers, which are not upon the other. A description of one side will answer for both. The locomotive consists of three very distinctive parts, viz.:—the boiler, the cylinders and their ajuncts, and the wheels. The boiler may be said to be the most important part of a locomotive; for the usefnl effect of the machine depends on the quantity of steam which the boiler is capable of generating in a given time; and the production of steam depends upon the amount of caloric or heat, which the water in the boiler absorbs to raise it to that point of temperature at which it assumes the vapory form, and expands to more than seventeen hundred times its original bulk. The utility of the boiler depends upon the amount of heating surface; and the greatest amount of heating surface embraced in the smallest amount of space, is the grand desideratum. To obtain this, all locomotive boilers are built with a great number of lap-welded iron, or brass tubes, extending through the body of the boiler, from the fire box into the chimmney. Their ends are properly secured in plates; the heat from the fire rushes through them, and as they are surrounded with water, they present a great amount of heating surface in a small space. In a large boiler, like the one in the engraving, the tubes are each one inch and three-quarters in diameter inside; there are one hundred and thirty-six in the boiler, and they are 15 feet long. The fire-box is surrounded with water in the side chambers, and a little above the furnace door, inside, there is a plate, firmly supported by stays, which is called the "crown plate." The water-line in the boiler is a little above this plate, and the large dome behind, on which is placed the whistle, is just above the crown-plate of the fire-box, and answers the purpose of a steam reservoir. The waist of the boiler is cylindrical, the best form for strength, and the shell, or outside, is formed of plates of the best boiler iron, well riveted together. There are two safety valves; the one in the enclosed chamber, on the middle of the boiler, is out of the reach of being tampered with, and the other is on the back large dome, under the command of the engineer. There is a small door in front of the chimney, for access to clean and repair the tubes. The chimney has a spark-arrester in it. This is a peculiarity of wood-burning locomotives; none are employed on coal-burning engines. It is very uncomfortable to travel by railroad sometimes, on account of the sparks—no arrester being perfect in its construction. A pipe inside of the shell of the boiler leads from the large back dome into the secondary dome behind the smoke-pipe. From this dome it is let out, by a valve, into a pipe leading into the valve-chest of the cylinder. This second dome and its peculiar throttle valve inside, prevents what is termed *priming*. This priming is a violent agitation of the water in the boiler, by which some of it passes over into the cylinders, injuring their useful effect. Safety valves are placed on the cylinders, to deliver them from this spray, and engineers are often seen trying their cylinders before they start.

The steam employed is about one hundred pounds working pressure on the square inch. One of Salter's spring balances is used on every boiler to indicate the power of the steam. There is a pressure of 7 tons 200 pounds weight on every square foot of the boiler shell.

By opening the throttle valve by one of the lever handles, the engineer lets the steam from the boiler into the valve steam-chest, and then by operating another handle, he lets the steam into the cylinder, under one end of the piston, and the piston moves in one direction, operating, by its connecting rod, the driving wheel, on the main axle of which is an eccentric inside of the wheel, which is connected by a rod and rocking shaft with the slide of the valve, which valve is moved, and as the piston attains near to the end of its stroke in one direction, it shuts off the steam from the passage it first went in at, and lets the steam in by the other passage under the other end of the piston, while, at the same time, communication is opened by another passage of the valve, which lets (exhausts) the steam out from before the piston, and then the piston moves back again; and thus, by letting the steam exhaust from one end, and push against the other alternately, a reciprocating motion is given to the piston rods of each cylinder, which by the crank-pins on the driving-wheels, give them a rotary progressive motion. There are two slides for every cylinder, so that the engineer can let on the steam to the piston, either to run forwards or backwards. The valve rods are worked by two eccentrics on the main shaft for each cylinder. The exhausted steam from the cylinders is let out by a pipe into the chimney. This creates a great draught, and it is upon the efficacy of this great draught, that the whole efficiency of the engine depends. The ash-pan opens forward at the bottom of the fire-box, opposite to the engineer, and as the engine runs forward, and the steam rushes up the chimney, the air rushes between the grate-bars up through the fire, causing a rapid combustion of the fuel. The long pipe noticed at the side, is to convey water from the tender behind, to supply the boiler. Two pumps, one on each side, force the requisite supply of water, at every stroke, into the boiler. There are try-cocks in the back of the boiler, for the engineer to open frequently, to see that the water is at the proper water-line in the boilers. The engineer can cut off his steam at will, regulate the exhaust of steam into the chimney, and cut it off and let it into the cylinder in any direction, by the handles shown, which are fixed on the right side of his engine. The accompanying engraving represents an engine of 162 horse power, and is capable of drawing 225 tons at the rate of about thirty miles per hour. If we imagine two giants of men in strength, but not in stature, each of 81 horse power, and seated (one on each side of the boiler) grasping the cranks on the main driving wheels, which are six feet in diameter, and then if they push their arms backwards and forwards, so as to make the wheels spin round 3,334 times in one hour, they would be able to move 675 tons, in that period, a distance of twelve miles. There is a certain velocity, however, past which neither the human arm can go, nor the animal horse run. In this respect, the iron horse has a great advantage; no exact limitation has yet been set to his real speed, at least as a point of comparison between the animal and the iron. The axles of the wheels are hung in boxes attached to springs, a great number to which are now made of India rubber, to prevent severe concussions from inequalities of the rails. Every locomotive should have its separate parts put together as well and carefully as those of a watch.

One of the grandest sights in the world is a locomotive with its huge train dashing along in full flight. To stand by night at the side of a railroad, when a large train is rushing along at the rate of 30 miles per hour, affords a sight both sublime and terrific. No wonder the simple backwoodsman declared that the first locomotive he ever saw was "pandemonium in harness." It is extremely exhilirating to witness the iron steed saddled and bridled, issuing with a scream from his dusky stable to run his race. What are all the feats of the turf in comparison with his? Fashion, Bostona, or Voltigeur, would make but sorry competitors with him for a single half hour. And what are all the feats of jockeyism, in comparison with the skill, the intrepidity, and the resources of that man with the swarthy brow, who stands on the platform before the fire-box, with his hand upon the handle, to rein in his iron steed at will.

The first real successful issue of the locomotive, was the performance of the "Rocket," at the opening of the Manchester and Liverpool Railroad, in 1829. This engine was built by the famous engineer, Robert Stephenson, and was the result of a great many experiments. It had a tubular boiler, and used the exhaust steam to create a draught. Without these, the locomotive would not have been successful. Colonel John Stevens, of Hoboken, invented the tubular boiler in 1805. He was a very ingenious gentleman, and advocated the construction of a railroad through the interior part of this State, long before there was a single canal or railroad in America.

It is now only 22 years since the first passenger railroad was opened, and since that time, no less than 20,500 miles of them have been constructed in different parts of the world.

We are indebted to Messrs. Fowlers & Wells for the above engraving which appeared in the Phrenological Journal. The engraving represents a locomotive built by Mr. Mulholland, M. M., of the Reading Railroad, Pa. It was first given to the public in a work termed "American Locomotive," by Emil Reuter. After four numbers of this work were published it ceased. We hope it will be resumed again, for it was a most excellent one. We hope friend Reuter will be enabled to finish the work he so ably began.

There is no good work in existence on American Locomotives.

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New Inventions.

Improved Row-Lock for Boats.

Mr. James Beetle, of New Bedford, Mass., has invented and taken measures to secure a patent for an improved rowlock which is especially adapted for whale-boats. The new row-lock is made with a socket which fits over a spindle on the gunwale of the boat. This row-lock gives with the oar. Oar-locks have been and are made in such a way that the spindle accommodates itself in its bearings to the action of the oar, but owing to the peculiar action of the oar, the spindle soon wears its bearing, and the lock then makes quite a clattering. In pursuing whales it is required that the boats should approach the monster of the deep with as little noise as possible, and this improvement will enable them to move as quietly as if the oars were muffled. There can be no fears of the bearings wearing uneven, therefore, by keeping the sockets of the oar-locks well lubricated, whalemen will be enabled to steal as softly as the sleeping sea upon their prey This improvement makes the act of rowing much easier. Another improvement connected with it, is the securing of the spindle of the oar-lock in a moveable bar of the gunwale. This bar is united to the gunwale by hinges, and is fixed on the top with a button. When the boat comes along side of the ship, all that is to to be done is to take out the oars, turn round the button of the moveable bar and the oar lock folds inside of the boat like a flap. This is a good improvement.

Machine for Greasing and Tarring Spun Yarn.

Mr. Francis Tuffts, of this city, has invented and taken measures to secure a patent for a machine to prepare spun yarn for sail makers, which will be of immense benefit to them. At present sail makers prepare their yarn, for sewing sails, by hand, and every thread takes up about half a minute's time in preparation. The machine invented by the gentleman named above will enable a boy to prepare as much spun yarn in five minutes as ten men could do in one hour by hand. A ball of spun yarn is placed upon a spindle, and the end of it is guided down over a pulley through a small vessel containing the melted grease and tar, then from this, between two cushions, on to a spool. By turning a handle the spool is set in motion, the yarn passes through the material to prepare it, and the cushions spoken of press out and strip off all the superfluous material, when the yarn is received on the spool in the proper state for sewing. The operation can be performed with great rapidity.

A New Kind of Fence.

Mr. John R. Remington, of Montgomery, Alabama, the inventor of the Remington Ærial Bridge, has patented a new and useful invention. It is a cement, for making solid fences, as durable as granite, and at very reasonable cost of construction. The chief ingredient is sand, and it can be easily manufactured by plantation hands. The cement panels are conveyed to the spot where the fence is located, and the two legs of each let into the ground like common posts. The cost of the plaster is estimated at 10 cents per panel of ten feet by five—four inches thick—far cheaper than the wire fence. It does not, or at least should not, detract from the merit of this invention that it hails from Alabama this time, rather than from Maine or Pennsylvania, or that the modest little town of Montgomery ventures competition with the great manufacturing cities of the East for the honor of originating some of the useful discoveries of the age.—Exchange.

[We have seen the above in quite a number of papers. We believe it will be very hard to find the claim for such a patent.

The Electro-Magnetic Locomotive.

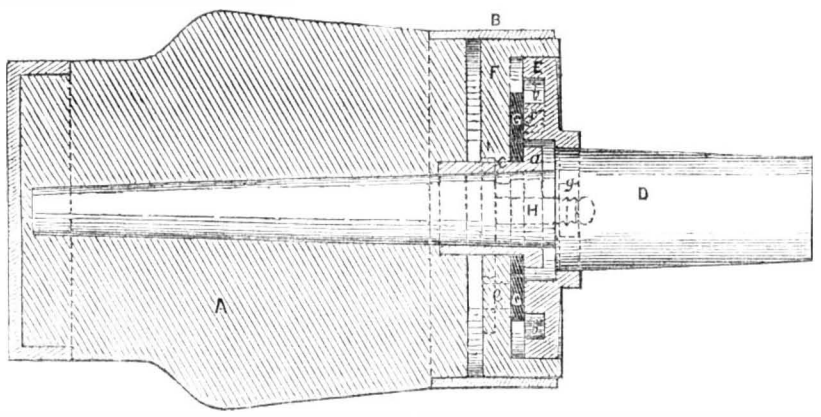
The National Intelligencer of Saturday, says that a preliminary trial of Prof. Page's Electro Magnetic Locomotive was made a day or two before, for the purpose of testing the best mode of attaching the battery, which seems to be a difficult point, owing to the jostling and oscillations of the locomotive. It was run out over two miles, and the best speed on a straight track was ten miles an hour. The locomotive weighs ten and a half tons, and has five feet drivers, with two feet stroke.

Dick's Anti-Friction Press.

Last week, in company with a few scientific gentlemen, we examined one of the largest presses we have ever seen: it was built on the principle of Dick's Patent, by Mr. J. E. Holmes, Jane street, N. Y., for the "Methodist Book Concern." The press is 5 feet 6 inches between the plattens, 24 by 30 feet clear between rods, and has 22 inches movement. It is so constructed that the power applied will produce 860 to 1 through the first 2 inches of motion, and 6,890 to 1 through the last 2 inches. It is intended for 1,000 tons pressure, and can be worked to that pressure in 15 minutes by the application of a two horse power. In every respect this is a great press. Mr. Holmes will be an exhibitor with one of his presses at the "World's Fair."

These presses are manufactured by the Matteawan Co., W. B. Leonard, Esq., No. 66 Beaver st., is Agent.

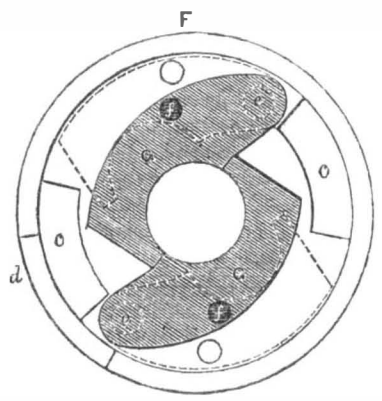
IMPROVEMENT IN WAGON HUBS.---Figure 1.



This improvement is the invention of Mr. Elnathan Sampson, of West Claremont, Sullivan Co., N.H., who has taken measures to secure a patent for the same. Fig. 1 is a longitudinal section of the hub of a carriage wheel, with the axle in the same. Fig. 2 is an inside view detached from the axle; figure 3 is an inside view of a disc, with the end of the axle, D. The same letters refer to like parts.

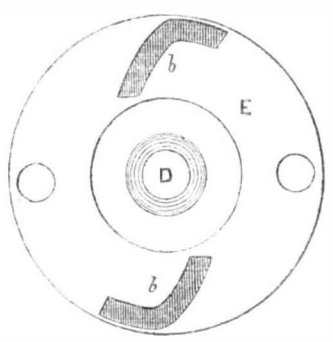
The improvement consists in having locking jaws, whereby the wheel and axle are easily disconnected, and whereby all dust and dirt are prevented from entering the axle box. A is the hub, with a hoop, B, projecting on its inner end; C is a neck projecting from and secured to the hub at its centre, and constituting a bearing for the axle, which is formed with a collar, *a*. D is the axle; E is a disc fitted to it and provided with peculiar shaped grooves, *b b*, on its inner face, and a circular cavity at the centre for the reception of the

Fig. 2.



collar, *a* F is a short box formed with a disc, having a rim projecting at right angles from it, and of such a diameter as to fit closely within the hoop, B. The central aperture is somewhat larger than the collar, *a*. There are segmental apertures in it, marked *c c*, which are bound on their back parts by countersunk indentations for the reception and travel of bolt heads; *d* is a slightly sunk segmental space on its edge. G G are the locking jaws working on pin axes, *e e*, made fast to the box, F. These jaws are of such a form, that when meeting there will be a circular space formed of rather a larger diameter than the neck, C; they are provided on their faces with studs, *f f*, which, when the several attachments, are joined, fit into and travel in the grooves, *b b*. H is a bolt (the other is not seen) which passes in and is secured by the nut, *g*, from the outside. Supposing the box, F, to be seated within the hoop, B, as in fig. 1, and the jaws, G G, occupying the position shown by the dotted lines, fig. 2, the axle, D, being made to enter the hub through the neck, C, the disc, E, also entering the box, F, and its grooves receiving the studs, *f f*, with the bolts, H H, passing through their apertures; then, by slightly turning either the box, F, or the axle and the disc, E, (one of them being kept stationary), the grooves, *b b*, from their peculiar shape and construction, acting upon the studs, *f f*, will cause the jaws, G G, to work towards one another, and close within them the neck, C, whose flange, *a*, prevents

Fig. 3.



the withdrawal of the hub when thus locked. By screwing up the nuts, *g*, on the bolts, H H, all the parts are firmly united. By slacking the nuts and turning the parts spoken of in the contrary direction, the jaws are opened and the wheel can be taken off almost in an instant, either for lubricating or any other purpose. More information may be obtained by letter addressed to the inventor.

Blowing Great Glass Globes.

The secret of blowing great glass bubbles, like the decanter which the French intend to exhibit at the World's Fair, consists simply in moistening the mouth with a little water before blowing. The water is converted, in the interior of the drop, into steam, which vastly aids the breath in extending the dimensions of the "bell."

Telegraph Suit.

The Morse Magnetic Telegraph Co., of this city, had a suit decided against them last Monday, by Messrs. Brooks, of the "Express," to recover damages for not delivering an important message received from Washington, last year, giving an account of the dismissal of the French Minister. The dispatch was withheld because a former debt (a disputed one) of $5,50 would not be paid. The damages awarded were $300. The testimony of editors was admitted to show the damages that might ensue by the Telegraph Company withholding special dispatches.

Scientific Convention at Cincinnati.

The next meeting of the American Association for the advancement of Science will be held at Cincinnati early in May next. This will be the first session of the Association in the West, and it is hoped that there may be a general attendance, particularly from the Western and South-western States. The results of American Scientific research cannot be diffused to any extent byany other organization in this country, and the "American Association," founded upon the model of the British Society from which it derives its name, has already earned a honorable place among scienentific institutions.

The annual meeting will be held in Albany next November we believe.

Great Cavern Discovered in Vermont.

We see by our Vermont exchanges that a large cave was discovered near Manchester lately. The cave is situated upon the southern extremity of the Equinox mountain, about half way from the base to the summit. The individual who made the first discovery was in hot pursuit of a wounded partridge at the moment, and was precipitated without notice. The hunting party of which he was one, then came up and found that it led, by a gradual descent of about thirty feet, into a spacious apartment, measuring thirty-six feet in length, twenty-seven feet in breadth, and thirteen feet in height, and having a bottom as level, and almost as smooth as a floor. From this room, a narrow passage, through which they made their way with great difficulty, and not without bruises, brought them into an apartment far exceeding the former, both in extent and magnificence. The most prominent objects which met their eyes in this second room were three colossal pillars, twenty feet in height and fifteen feet in circumference, of spectral whiteness, and smooth as polished marble. In the third room they found considerable quantities of iron and lead, together with a kind of ore resembling silver.

The Electric Piano.

Mr. Davenport of Salisbury, Vt., we learn, claims to have made an improvement in pianos, causing the musical chord, by means of electric magnets, to continue an equable and free vibration for any length of time. The perpetual and hitherto incurable defect of the piano forte is the impulsive and evanescent nature of its tone, and though great improvements have been made upon it, and various devices have been elaborated to prolong its notes in some degree, yet the want of a sustained vibration is still an inherent defect in that beautiful instrument.

New York Mechanics' Institute.

This Institute has removed to the large building at the junction of Division street and the Bowery, and have tastefully fitted up part of the first floor, as a Polytechnic Exhibition. The Members have exhibited a great deal of spirit, and have gone to a great expense in fitting up their new rooms. It is to be hoped that the mechanics of our city will give it their hearty support. This they can do without any cost to themselves except becoming members, and the fee, $1, is but small. The City of New York should support one of the best Mechanics' Institutes in the world. The sum of $1000 has recently been applied to add new books to the library.

A Chance for Inventors.

The Emperor of Russia has commissioned his agents to purchase every model at the Great Exposition, which may be useful to Russian manufactures. A letter from St. Petersburg announces that the Emperor intends to spend 10,000,000 silver rubles in such purchases.

The Pennsylvania Legislature has passed a law prohibiting the storage of a larger quantity than 100 lbs. of saltpetre in any of the incorporated districts of Philadelphia County. This is a most absurd law.

The hens of Egypt now lay eggs for the Londoners. Thirteen casks were lately landed at Southampton from Alexandria.

Many of the London journals notice the death of Mr. Audubon. One of them characterises him as the greatest ornithologist that ever lived.

London has more population than Greece more than half that of Belgium or Holland, as much as all Hanover, and within half a million of half as much as Bavaria.

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Scientific American

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Cotton versus Flax.

It cannot be denied that great efforts are now being made in England to improve flax in its manufacture, so as to render it in a great degree a substitute for cotton. The high price of cotton during the past year, and the total dependence, it may be said of British manufacturers upon America for a sufficient supply of it, has led them to look about for some *escapement* which should enable them to regulate their own supply, and consequently their own prices. For this purpose, they have encouraged the cultivation of cotton in the East Indies, at an immense outlay of capital, but hitherto without success. And now just when cotton is so high in price, out comes the alleged new discovery of Clausen—a brief account of which we published last week, which is to make flax a cheap substitute for cotton. The principal improvement consists in treating the flax straw with alkalies and acids; obviating the usual tedious and unhealthy processes of dew and wet rotting; bleaching the straw, and splitting it up by a chemical process into minute fibres termed "flax cotton." Cotton is of a fine plastic rolling nature, which enables it to be easily drawn by machinery. Flax is of a very different nature, and heretofore, never could be operated by cotton machinery. The product of flax to the acre is more than ten times, by weight, that of cotton, but then there is a vast amount of refuse woody matter in it, all of which has to be separated from the fibrous parts, before it can be put upon a spinning frame. The expense of this process has kept flax higher in price than cotton. Mr. Claussen asserts that his new plan obviates the great expense and unhealthy processes hitherto practised for preparing flax. If it were true that the flax by this process could be produced as cheap as cotton, and that it could be spun as easily on the same machinery, surely the price of cotton would have been lowered by it before this, but it has not. There can be no doubt but great improvements may be made in the preparation and manufacture of flax, but cotton requires to undergo no such tedious process to prepare it for the spinning frame, consequently it will always maintain its natural value and standing as the most useful and easily manufactured fibrous material.

The Royal Agricultural Society of England, has taken up the subject of flax culture, with great zeal, and the process of Claussen has received the most marked attention. Measures are now in progress for the cultivation of a far greater quantity of flax in Ireland. Flax can be cultivated in Ireland equal in quantity, if not superior in quality, to any other in the world. That moist climate is peculiarly adapted for feeding a plant which derives so much nourishment from the atmosphere. The question which interests our people, is that of cotton, for it brings in a greater revenue than any other American product. If flax can be used as a cheap substitute for cotton, England will be the gainer and we the losers. Nothing should blind us to this view of the question—it is plain and rational. We have heard it suggested that as the deficiency of cotton crops for the past two years has increased the price of cotton, and "more money has been returned for a small than a great crop, it would be to our profit, to raise less, in order to enhance its price." This would not be good policy, it would certainly lead to the discovery of some suitable substitute that would be ruinous to the cotton business itself. The Dutch cut down the nutmeg trees of Ceylon, to enhance the price of that spice, and the result was most disastrous to such blind policy. The great object of our planters must be to produce the greatest amount of the best cotton to the acre, and to produce that, at the least expense to themselves. This will enable them to stand in the van of agriculturists in supplying the world with a material, the cheapest—and best as such—for manufacturing purposes.—This is a subject which, at the present moment, is of deep interest to our cotton growers.

The Probable Relation between Magnetism and the Circulation of the Atmosphere.

This is the title to the Supplement of the Washington Astronomical Observations of 1846, by the scientific Lieut. Maury, of the Washington Observatory, and which we noticed last week. It is a singular document: it begins with, "the discoveries of Farady in dia-magnetism are calculated to guide me and to illuminate the darkness by which I have oftentimes found myself surrounded, as I endeavored to follow the 'wind in his circuits' over the trackless wastes of the ocean. Oxygen composes one-fifth part of the atmosphere and is magnetic."

[In reference to Mr. Paine's letter, page 114, about Faraday making the discovery of oxygen being magnetic, we would state that he made this discovery years ago, long before the period referred to, as can be found in his published works—consequently Mr. Paine's allusion to Mr. Archibald is something we cannot understand.) The discovery of the magnetic property of oxygen, Lieut. Maury believes, "is the keystone for some of the most grand among the sublime and beautiful structures which philosophy is erecting for monuments to the genius of the age."

In the distribution of moisture, and the circulation of the atmosphere over the surface of the earth, he often suspected that there was some other agent at work than heat, and the rotation of the earth on its axis. His wind and current charts, which have conferred celebrity on his name, enabled him to trace a belt of calms near the Tropic of Cancer. From the zone of calms at the Tropic of Cancer, there proceed two currents, named the "trade winds." The north-east trade winds proceed from the south side of the belt of calms to the equator; and the south-west trade winds proceed from the north side of the belt of calms, and make up two-thirds of our south-west winds to England. These are surface breezes. From the equator there is a perpetual upper current to the tropical calms, equal in volume to the trade winds. One peculiarity of the trade winds is, that the south-west breezes give out a great deal of moisture, although proceeding from a calm belt to cooler regions, in a course where precipitation is the natural result. The north-east trade winds, on the other hand, proceeding from the same belt of calms, are dry at the very outset. It was supposed that the upper current which flowed from the calms at the equator, descended at the calm belt at the tropics, and then returned on the surface as a trade wind, then ascended at the equator, returning as an upper current, thus keeping up a continual ring of breezes, Lieut. Maury says," he knew of no agent in nature that would prevent the winds taking this circuit, but on the other hand, he knew of circumstances which rendered it probable that such in general is not the course of atmospherical circulation."

But there are also south-east trade winds, and Lieut. Maury has come to the conclusion, that the current which flows to the equator as a surface north-east trade wind, ascends at the equator calms, and passes to the south as an upper current, while the current which comes as the south-east trade winds ascended and passed to the calm zone of Cancer. The reasons for this conclusion are, that the evaporating surface of the south is the greatest, but all the great rivers are in the northern hemisphere, and at those seasons of the year, when the sun is evaporating most at the south, the greatest quantity of rain is falling in the northern hemisphere. Without taking this view of the subject, Lieut. Maury "could find no part of the ocean of the northern hemisphere from which the sources of the great rivers, Mississippi, St. Lawrence, and others, could be supplied. It appeared to me," he says, "that the extra tropical regions of the northern hemisphere stood in the relation of a condenser to a grand steam machine, the boiler of which was in the region of the south-east trade winds," and the north-west trade winds to the Tropic of Capricorn, on the other side of the equator, perform the same office to the regions beyond that tropic, which the south-east winds perform for our northern regions. In this pamphlet various letters are published from farmers dwelling in the south-western states, in answer to enquiries made by Lieut. Maury, stating that south-west winds generally bring rains in those regions. [In New York City, our easterly winds are the rainy currents—an east wind never fails to bring rain.] So far the evidence to the above deductions was only circumstantial, when he received a copy of Ehrenberg's work, from the Prussian Minister at Washington, and in it he found it stated, that this celebrated German microscopist discovered South American infusoria in the red rains of Lyons, Genoa, and other places of Europe. This, then, was direct testimony—*prima facie* evidence of the truth of his theory.

It is stated that, having likened the circulation of the atmosphere to a continued whirl of the wind in the arctic regions *against*, and the antartic *with* the hands of a watch, according to the electro-magnetic discovery of Ampere, he has found this conclusion very significant. The south-west winds enter the arctic regions, on a spiral curve, continually lessening the gyrations, until, whirling about in a contrary direction to the hands of a watch, this air ascends and commences its return as an upper current, to the belt of calms at the Tropic of Cancer.

Lieut. Maury attributes to magnetism that influence or power "which guides the air from the south through the calms of Capricorn, of the equator, and of Cancer, and conducts it into the North," and back again. This he compares to a spiral coil, and the continuous circuit of a magnetic current passing around both poles and winding across our globe. The attractive and repulsive influence is attributed to the nature of oxygen, which, as its temperature is increased, diminishes in para-magnetic force, and which increases as its temperature falls The subject is a sublime one, and is treated in that curt, mathematical, and forcible style peculiar to the old authors. He states that the footsteps, only, of this agent—magnetism influencing the winds—have been discovered. There are yet great mysteries in the ocean of air which envelopes us. The general calms in the arctic regions, and the great storms in the antartic, have yet to be properly accounted for, but hitherto we have looked upon our atmosphere as neutral in relation to magnetic force, because oxygen is magnetic and nitrogen dia-magnetic. Our atmosphere is a compound of a magnetic and a dia-magnetic gas, and the dia-magnetic is as 5 to 1, consequently the oxygen must have the least influence; but may not this account for the difference of whirls at the opposite poles?

Inventions, Patents, Patent Laws, &c., in England.

We have received, through the politeness of Messrs. Thos. Prosser & Son, a brief pamphlet published in England, containing "Observations and Suggestions," by a member of the committee of the Society of Arts, prepared in conformity with certain principles laid down in November, 1850, by a committee of said society, to promote legislative recognition of the rights of inventors. In the observations contained in this pamphlet there are some mistakes: it is stated that "no trace of protection for invention is to be found in the Roman Civil Law." If, by this, it is meant that no written *patent* was issued by government, or its officers, the statement is correct, but that public rewards and honors were bestowed upon authors and inventors, every one who has read history can attest, and there are also laws to be found for their encouragement. A very extraordinary error is made with respect to the American Patent Law. The writer quotes the clause of the Federal Constitution adopted in 1787 giving Congress the power to pass laws "to promote the progress of science and useful art, by securing, for limited times, to authors and inventors, the exclusive right of their respective writings and discoveries," which, he says, is dated in 1790, and which he confounds with the Act of Congress enacted in pursuance of it in 1790. This clause of the Constitution was borrowed from a clause in the Articles of Confederation adopted during the Revolutionary War, and is nearly word for word like it. There are several suggestions touching the modification and improvement of the English statutes, which are worthy the attention of her law makers. We have, on several occasions, advocated a change in the laws of Great Britain, and we still hope that some action will be taken upon them at an early date. To say the least they are very unjust to the English people as well as the inventor.

Silver Change and the Three Cent Pieces.

At the present time it is very difficult for mechanics and tradespeople, in our city, to do their little retail business with grocers, &c., on account of the scarcity of small silver change. No body will give change for bills without a bonus of five per cent. This is owing to the rise in the value of silver. Seme opaque philosophers have not been able to account for this, and say, in some long-winded articles in our reviews, that they do not know whether silver has grown more valuable, or gold less valuable. Just let them ask a mechanic the question, after having changed a V for silver, and they will soon get a correct answer. The silver coin should be reduced at the mint, if it could be, to meet the demand of the relative current value of silver to gold, so as to keep the silver in the country. We are right glad at the prospect of the three cent silver coins, which will soon be in circulation to meet the demand of the Post Office Bill. Three cent pieces are going to be the most convenient coinage for small change that we can possibly have. The following statement will show how easily change can be made with them:—for payment of three, six, five, and ten cents, the existing and proposed silver coins would naturally be used. For nine cents, give three three cent coins; for eight cents, a five and a three; for one cent give two threes and take a five, or give a dime and take three threes.

A Patent Suit.

The Trenton True American, N. J., of the 26th gives an acount of the termination of a suit in the U. S. Circuit Court for the district of N. J., Judges Grier and Dickerson presiding, and the parties being Horace H. Day, vs., Charles Goodyear. The motion of the plaintiff was for an injunction to restrain the defendant from prosecuting a suit upon a covenant upon the ground that the covenant sued upon by the defendant was not all the covenant between the parties, and that the complainant could not defend himself against the single covenant sued upon, but could do so upon the whole covenant. The defendant contended that if there were any other agreement than the one sued upon, the complainant might plead it himself, and could not call upon the defendant to set it out in his declaration. The Court decided that this was only a question of pleading, and that it appeared by the authorities that the complainant could not, under the state of pleadings at law, avail himself of his full defence; and that the suit at law should be restrained until answer of defendant was put in. The injunction demanded by Day was granted, and thus confirming the verdict of the Jury at the last term of Court. Vroom, for the plaintiff; Staples, of New York, for defendant.

A Clock for Sixty Cents.

Mr. Chauncy Jerome, of New Haven, Conn., has actually made a time piece, which he will warrant to keep good reckoning, and which he sells for 60 cents at wholesale, and $1 at retail. The works are all made of brass. He makes upwards of 800 a day of these articles.—[Exchange.

[After this let no one want a clock. A few years ago, (only 12 we believe) the old wooden clocks sold for $10, now no one will have a wooden clock. Common brass clocks can be bought in abundance for $2 a piece, but it seems Mr. Jerome has capped the climax of cheap time keeper.

With a diamond point, in a good ruling machine, employed by engravers, parallel lines may be ruled upon plate glass as fine as 2,400 to an inch. This would appear incredible, yet it is stated by good authority; and yet, for all this, there are insectoria—active and living creatures, more minute than any of these lines.

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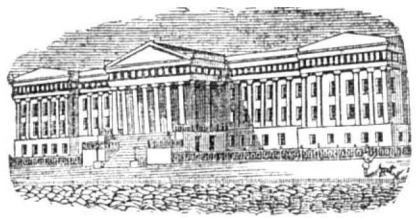

☞Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING MARCH 25, 1851.

To Geo. Heffley, Samuel Conrad, and Jas. Wigie, of Berlin, Pa., for improvement in adjustable land sides of Plows.

We claim providing a right-angled heel plate with a hook, for the purpose of interlocking with a hook-shaped projection, attached to the land bar, forming a hook joint, said heel-plate forming the bottom and side of the land bar, and having its rearward portion susceptible of vertical adjustment, by means of a screw, and when adjusted being clamped by a horizontal screw bolt, its shank being placed in a segmental slot, to admit of its moving with the heel-plate, as described.

To C. W. Krebs, of Baltimore, Md., for apparatus for securing shutters in any required position.

I claim the right to the rods, pintles, sockets, screws, and apertures connected, arranged, and acting substantially in the manner and for the purpose described.

To Michael Norton, of Cambridge, Mass., for improved Sash Hook.

I claim the spring to throw the turning hook outwards, the spring-catch, G, (applied to the frame of the hook), and the projection, H, (extending either from the curved rail, or the lower window sash), in combination together, and with the said clamp hook and rail, the whole being made to operate substantially in the manner specified.

To Lewis Thorn, of Philadelphia, Pa., for improvement in Extension Tables.

I claim, first, the slides E and F, in combination with the cross-bars and folding rails; and second, the recess for the reception of the loose leaves; being formed substantially in the manner and for the purpose set forth.

To N. W. Speers, of Cincinnati, Ohio, for apparatus for moving and securing shuttles, etc.

I claim the manner of opening and closing window shutters from the inside, and securing them firmly at any point in their semi-circuit, by means of the horizontal screw shaft inserted in an opening in the lower portion of the window frame metallic nut surrounding the same, and the bar or plate attached to the shutter, substantially as described.

To R. C. Stevens, of Syracuse, N. Y., for improved apparatus for drawing and measuring liquids.

I claim the combination of measures with faucets, cocks, or gates, used in drawing liquids from can casks, barrels, &c., in such a manner, that, by opening the faucet attached to the cask, the measure will be filled; then, by closing the same, the desired amount may be drawn by opening the corresponding faucet in the measure; the whole combined substantially as described and for the purpose set forth.

To E. G. Lamson, of Shelburne, Mass., for improvement in Scythe Fastenings.

I claim the combination of the two wedge shaped bearers, the confining bolt, and the support at the extreme or other end of the shank, as constructed, substantially in the manner specified, the whole being for the purpose of enabling a person to change the positions of the blade of the scythe, in a direction transversely of the plane of the blade.

To Heman Whipple, of Port Richmond, N. Y., for improvement in machines for preparing clay for making brick.

I claim the use of a revolving screen, constructed of bars set at a slight inclination from the horizontal position, having lugs or crushers within it, each lug being hung or suspended at one end, on a bar, and prevented from touching or rubbing the screen, by a cord or chain attached to its other extremity, and rod, supporting it, or constructed and operating in any manner substantially the same and for the purpose herein set forth.

To Henry Klepfer, of Cincinnati, O., for improvement in upright Pianofortes.

I claim the arrangement of the sounding board in upright pianos between the strings and the performer, substantially in the manner described.

To Nathaniel Lamson, of Shelburne Falls, Mass., for improvement in Scythe Fastenings.

I claim the arrangement of the hole or holes of the head of the confining clasp, in such manner, with respect to the axis of the screw that when the said screw is turned one hundred and eighty degrees, the position or positions of the hole or holes, may be changed in such a manner as to secure one or more new and different positions for the shank, the same being for the purpose as specified.

To F. B. Stevens, of New York, N. Y., for improvement in Balanced Valves.

I do not claim, as my invention, valves having seats of such relative diameters, that they shall be retained thereon by the pressure of steam; but I claim the above description of valve, where the disc is held by a support running up through the hollow valve, so forming the valve that the upper seat shall be larger in diameter than the lower one, by means of the ring attached to the valve, and by means of the ring attached to the seat, or by any means substantially the same, for the purpose of retaining the valve in its seat, by the pressure of steam, whenever its position or location, in respect to the steam passages, is such that the pressure of steam is below the valve when closed.

RE-ISSUES.

To Horace Billings, of Beardstown, Ill., for Composition for covering Hams. Originally patented 9th April, 1850.

I do not intend to claim as my invention the covering of meats or other articles, with paper and cloth, or other flexible material, previous to coating them with my preserving composition; but what I claim is the formation of a preserving composition for coating meats, cheese, fruits, vegetables, &c, by the union of rosin, shellac, or seed lac, and linseed oil, or other oil of a similar nature, substantially in the manner and in nearly the proportions as set forth.

To James Phelps, of West Sutton, Mass., for improvement in Washing Machines for cleaning rags. Originally patented Nov. 24, 1843.

I claim an adjustable, rotating water elevator and strainer, arranged substantially as herein set forth, in such manner that it can be raised or lowered in the vat of the washing or beating engine, to vary the quantity of water discharged therefrom; or can be raised entirely from the vat to stop the discharge of water, or for other purposes, as set forth.

I also claim a rotating prismatic screen or strainer, for straining the water from the paper stock, in the vat of a washing or beating engine, in combination with devices for discharging the strained water, the prismatic screen being not only more efficient than a cylindrical screen, but also admitting of more ready repair.

DESIGNS.

To Wm. & Wm. H. Lewis, of New York, N. Y., for Design for Pedestals and Columns.

To Joseph Pratt, of Boston, Mass., for Design for Parlor Grates.

Beware of Eating Red Wafers.

A coroner's jury, in London, lately held an inquest on the body of a child, 9 years old, who came to his death in the following manner:—The deceased was playing in the street with other boys, when, seeing some bright red wafers lying before the door of an oil-shop, they tasted them, and subsequently ate some. All the lads were taken ill, and deceased, who had eaten more then the others, died. The wafers contained red lead, and the symptoms of the boys' illness were those which ordinarily follow poisoning by that metal. The jury returned a verdict of "Accidental Death," with an admonition to the tradesman from whose shop the wafers had been incautiously swept.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

A lack of general knowledge in a large portion of our community, pertaining not only to scientific, but to matters of universal daily use, is very evident; and a want of inquiry into the causes of the phenomena of the events which are constantly transpiring before us, is likewise very apparent. The most trivial effect has its cause, although it may appear at first enveloped by a seemingly impenetrable cloud of obscurity, still upon a little wise reflection, to every cause can be assigned an effect, and every effect can be traced to its own legitimate cause.

In the present article it is attempted to include such an account as the limits will permit, of the principles and the processes of the manufacture of gas for illuminating purposes.

If the various inquiries, made by many in the community, are any criterion by which we may judge of the tenor of the information of the mind upon this subject, it is time that a practical work should be placed within the means of every person, and particularly such as are now deriving the benefits of this great blessing. The want of a general knowledge and understanding of the principles of illuminating gas, is forcibly and truthfully shown by the ease with which people are led away by new lights (and I may say, too, false lights) which are brought before an unwary public, either from a speculative motive, or to gain notoriety, or perhaps by individuals, who, having more zeal than knowledge, are wrought into a false belief, by tenaciously clinging to what they consider their own new ideas. To aid in the more general diffusion of practical knowledge is the writer's aim, and if he should succeed in adding one thought to any person's vocabulary of wisdom, from whence a single new idea may germinate, his object will be fully gained.

It is within the memory of nearly all of us when the principal streets and avenues of our city were *supposed to have been lighted* by oil at night, and travellers were obliged to grope their way among these now-luminous objects, which seemed to render the darkness more visible, and the surrounding gloom served as an admirable covering, under which depredators could operate unseen and undetected. But now, when we look around us and see the great change which has been brought about through the influence of men of science and ingenuity, and are permitted to pursue our various vocations under the influence of this genial and cheerful light, ought we not to feel greatly indebted to the highly gifted and enterprising individuals by whose talents and industry, so great a blessing has been conferred upon society. And it is to this blessing, this new light, I would call the reader's attention.

The term *Gas*, in chemistry, synonomous with air, is employed to signify any elastic, invisible, aeriform fluid, permanent at the common temperature of the atmosphere, and not wholly condensable by any known degree of cold, natural or artificial. Animal and vegetable substances contain embodied within themselves gas; and all matter of a fatty, resinous, or bituminous nature, contains carbon and hydrogen, which become liberated when the substance is decomposed by heat, and form a new combination; this new combination is composed of 1 atom of carbon and 2 atoms of hydrogen, its atomic formulæ, therefore, would be $C+H^2$, and is termed carburetted hydrogen gas. Carbon, literally speaking, is the base of all illuminating gases, its richness and value being wholly dependent upon it. Before we proceed farther, it may be well to look into the nature of these two constituents, in order to have a perfect understanding of these important elements, and thereby to become familiar with their properties.

CARBON—This substance is very generally diffused in nature; all animal and vegetable substances contain it as do many of the minerals, either in the form of carbon or carbonic acid, free or combined. In charcoal, soot, coke, and animal carbon, it is black, amorphous, and very combustible; in graphite it is black, with a chrystallized foliated structure; and in the diamond it occurs diamorphous, colorless, and is chrystallized as a four-sided double pyramid (octahedron). United with oxygen it forms carbonic oxide, and with still more oxygen, carbonic acid. Carbon exists in all varieties of natural coal, bitumens, petroleum, and naptha; and in the form of carbonic acid, is contained in limestone, chalk, and various other minerals.

HYDROGEN—This substance was discovered in the year 1776, by Cavendish, and was formerly called inflammable air; its name is derived from two Greek words, signifying *water* and to *generate*. It is the lightest of all ponderable matter known, 14½ measures of it weighing only as much as 1 measure of atmospheric air. It is colorless and, when perfectly pure, inodorous; it is inflammable in an eminent degree, though, like other combustibles, it requires the aid of a supporter of combustion. It is attended with a yellowish blue flame, and a very feeble light. United with oxygen it forms water, and in the same proportions it is, in the aeriform state, an exceedingly explosive compound.

The first account which history affords of the knowledge of the existence of illuminating gas appears to be in the year 1664, when Dr. Clayton made known that combustible illuminating gas was produced during the decomposition of coal by heat; and that this could be collected. It was observed and experimented on, a century after, by Drs. Hales and Watson.

Lord Dundonald built some coke furnaces in 1786 and amused himself by collecting the evolved gases in tubes and burning them, but without any definite object.

Since the year 1792, another Scotchman by the name of Murdoch, to whom we are indebted for the invention of the useful application of gas, occupied himself incessantly with experiments up to the year 1796; which efforts were crowned, in 1798, by the erection of gas works for illuminating the manufactory of Boulton and Watt. Independently, and about the same time, Phillip Le Bon, a Frenchman, succeeded in illuminating his house by an apparatus in which he evolved the bad gas from wood (probably a mixture of carburetted hydrogen, carbonic acid, and carbonic oxide gases). The first establishment for the manufacture of coal was erected in London in the year 1805. In the year 1808, Mr. Samuel Clegg constructed an apparatus for producing gas, and communicated to the Society of Arts in Manchester; and a silver medal was voted Mr. C. for his communication. Mr. Murdoch, the same year, made a communication on the subject of gas-light to the Royal Society, and was complimented with Count Rumford's Medal for the same. Gas was employed for street illumination in London in the year 1812, and in Paris in the year 1815. In 1823 there were four large gas companies in London, having in all forty-seven gas holders at work, capable of containing 917,940 cubic feet of gas, and were supplied by 1315 retorts, which generated, per annum, 397,000,000 cubic feet of gas; by which 61,203 private lamps, and 7,268 public or street lamps, were lighted in the metropolis. From that time to the present the formation of new companies, the erection of extensive manufactories, and large expenditures, have become requisite to meet the increasing demand of the citizens for this highly desirable and economical light. At the present time the annual consumption of gas in the city of London is 3,000 million cubic feet; equal to about from 50,000 to 60,000 tons.

J. B. B.

(To be Continued.)

Fresh Water Frozen Beneath the Sea.

Fresh water was found frozen into solid ice in the lead which conveys the Cochituate water under the sea water of Boston Harbor to East Boston, and which pipe is 36 feet below the surface of the water. The explanation of the phenomena is, that fresh water freezes at 32 deg. F., while sea water requires a reduction of temperature 4½ deg. lower, or to 27½ deg., before it solidifies. Thus, the salt water was doubtless cooled, below the freezing point of pure water, and conducted away the heat from the lead pipe, so as to lower its temperature sufficiently to cause a film of ice to form on the inside of the pipe, and by successive layers of ice the pipe was gradually filled.

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TO CORRESPONDENTS.

W. P., of Ill.—You are well aware, we suppose, that the air engine, acting nearly on the principle you describe, is older than the steam engine; you have only looked to the pressure of the air to assist in one direction, while it resists to the same amount in the other direction, and nothing is gained, and nothing lost, to be sure. The air-tight cylinder was one of the grandest improvements ever made on the steam engine.

T. J. J., of N. Y.—A wedge rail and grooved wheel has been long known; they were used before the T rail. They do not answer at all. This same plan was proposed by Mr. French, of Va., for steep inclines. In your plan for engraving, the whole work would have to be done on the wax, as carefully as on the clean wood. This would take as long, as the wood is very easy to work. The plan is the same as that for etching copper-plates.

J. L. P., of Phila.—The galvanizing of the iron is to cover it with zinc. Clean the iron well, then have the zinc melted in an iron vessel, and put in some salamoniac and tallow, then dip in your plates. We do not know the establishment where the galvanizing is carried on.

J. L. B., of ——.—We do not know what would be the price of the agricultural analyzing apparatus to which you refer, nor where it could be found. The best works on the subject of Agricultural Chemistry, are those of Johnston, Norton, and Liebig. Get those and you can do all the rest. We will try and fulfil your request at some future time.

W. P., of Mich —It is indeed true that you can destroy the equilibrium of pressure in a water box, by the inequality of the surface so as to produce motion on the side of the greatest pressure, but what amount of motion do you get? Any more than you give? No. There is no new power called into existence, and none but what is well known. We could not advise you to go to any more expense, for no ultimate benefit will result from the same.

C. J. M., of Ohio.—Yours next week.

V. K. of ——.—The depilatory powder to which you refer is not sold in this city. We could not speak personally of its merits. It does not at least remove the hair permanently.

J. E., of Ohio.—Its density is uniform throughout, but for railroad purposes it has been tried—and faithfully tried—and found unfit for the purpose.

A.B.G., of Ct.—Euclid is the best work you can get.

W. S., of Pa.—Gun-flints are all made by hand: we could give you the description, but it is too long to give here. The process is described in Barlow's Encyclopedia.

H. & W., of Andersonville.—We omitted to state in our letter, a few days since, that the $1 bill enclosed in yours of the 10th, was good; it was passed to your credit.

S. S., of Phila.—Geo. Bruce resides in this city and carries on an extensive type foundry.

D. B., of Mass.—We do not understand the advantages likely to arise from your plan for propelling canal boats over some others; neither do we see any patentable novelty in it to justify an application.

J. P G., of Me.—The elements in your machine for governing the water in steam boilers seem to be good, but this can never be satisfactorily determined without the aid of experiments, which must be made to satisfy yourself and others interested. There appears to be novelty in the arrangement which could be made the subject of a patent.

C. R., of Ill.—There is nothing so durable for the purpose as Roman cement. $1 received.

M. M., of Wis.—The proper way for you to obtain the desired information is to address a letter to the Commissioner of Patents, Washington, D. C., he will give you the information: no one else can.

X. Y. Z., of Mass.—We cannot give the information you ask for.

J. M J., of Me.—Such a machine as you refer to was patented some time since, by Joseph Graume, of Cincinnati, Ohio. The price, &c., we cannot give, but presume it can be obtained by addressing him as above.

T. B., of New Haven.—The price of Brewster's Optics, we think, is one dollar. It is the best work upon the subject up to this time.

R. B., F., of N. Y.—Pocket microscopes can be had for prices varying from $1 to $25; a good one can be obtained for $12. John Roach, 79 Nassau st., has them for sale. $1 received.

O. A. J., of Vt.—We have forwarded two copies of the Scalpel, as you directed.

H. E., of Cincinnati.—You could not obtain a patent for the sliding letters; they have been used before, and were made the subject of a patent some years since.

A. E. C., of Miss.—The circumstance you mention is not at all surprising or unusual: by reference to page 418, Patent Office Report, for 1849, Dr. Page mentions the fact that a patent was granted for one species of atmospheric churn, and before the fact could have been known far beyond the walls of the Patent Office, six inventors from different parts of the country were all pressing their claims before the Office for the same contrivance; cases of this kind have come under our own personal observations.

E. C., of La.—We can scarcely imagine how you are to accomplish the object you propose; it is contrary to the laws of chemical affinity. We think you will be disappointed in the end.

F. V., of Mich.—Your method of attaching the single wheel to the Cultivator could not be patented; contrivances for this purpose have been used before, and in a manner substantially similar to yours. We cannot encourage you to spend money upon an application.

A. H., of Mo.—The arrangement of the brushes we do not think could be secured by a patent. Some machines have been brought forward for cleaning streets where the dirt was all taken up and placed in a receptacle—none seem to have been effectual up to this time. We entertain the opinion that yours would not obviate a single difficulty not attained by Bishop's machine; neither can we see how a valid claim to a patent could be based.

C. A. C., of Md.—It would cost you about $300, by packet, to visit the World's Fair and remain three or four weeks, we should think; about two months would be consumed in going and coming.

J. L. M., of Ala.—The improved Corn Sheller belongs to Carter & Harris, of Yorkshire, N. Y., and is good, the price we cannot give. The "Refrigerator" is a good article, but as yet we have not heard of its being brought into the market. Messrs. Geo. Vail & Co. manufacture the horse power of Mr. Bogardus. Some improvements have been made whereby the friction is lessened, and is now, perhaps, as good for 4 horses as any in use: it is much used for cotton gins. James Stewart, of this city, makes good turning lathes at prices varying from $25 to $100. N. Hunt & Co., 110 Water street, Boston, are sole agents for Swingle's Patent Mortising and Boring Machine, price $125. Small sized mortising machines for light work can be had for $20.

W. L. L., of Pa.—The work to which you refer has been discontinued. Engineers and railroad companies would not support it.

M. S., of Ct.—Next week we will present to our readers an engraving of the Wind Mill.

W. F., of Boston. There are a number of engravings required to illustrate the welding process: they are now in the hands of the engraver.

J. C. H., of Miss.—We do not know where or at what price, such springs could be had as you require; H. H. Day, of this city, could make an india rubber one we should think. If such an one would answer your purpose you could address him upon the subject.

Money received on account of Patent Office business since March 26:—

E. B, of N. Y., $700; M. C. B., of N. H, $15; W. & B. D., of Ct., $30; G. B. C., of N. Y., $55; C. F. B., of R. I., $40; G. H. R., of Ill., $30; W. H. H, of N. Y., $20; J. C. B., of Ark., $30; A. G. D., of Ct., $45; W. G., of N. Y., $10; G. B. W., of N. Y., $10; T. & G., of N. Y., $30; H. & E., of N. Y., $30; A. S. B., of N. Y., $55.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since March 26:

W. & B. D., of Conn.; G. W., of Mass.; B. & M., of N. Y.; W. G., of N. Y.; I. B L., of Vt.; S. G. S., of Ga., and A. G. D., of Ct.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

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Branches of our Agency have been established in London, under the charge of Messrs. Barlow, Payne & Parken, celebrated Attornies, and Editors of the "Patent Journal;" also in Paris, France, under the charge of M. Gardissal, Editor of the "Brevet d'Invention." We flatter ourselves that the facilities we possess for securing patents in all countries where the right is recognized, are not equalled by any other American house. MUNN & CO.,
128 Fulton street, New York.

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29 6 Dean of the Faculty.

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At this Office

PORTABLE GRIST MILLS—Of the best construction, at the following prices:—12 inch hand mill, $40; 16 in. do., $45; 18 in. Burr stone, power, $90; 24 inch do. $100; 30 in. do., $150. $15 additional for the gearing of the 18 and 24 inch; the 12 and 16 inch are geared with cranks. The 30 inch is driven from the spindle; 18 in., 2 horse power, will grind 4 bushels per hour; 24 in., 3 horse, 5 bushels; 30 in., 4 horse, from 6 to 8 bushels; speed, 300 revolutions per minute. Address (post-paid) to
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CLOCKS FOR CHURCHES, PUBLIC Buildings, Railroad Stations, &c.—The undersigned having made important improvements in the construction of clocks, especially in the apparatus for counteracting the influence of the changes of temperature upon the pendulum, and in the retaining power, together with a most precise method of adjusting the pendulum to correct time, are prepared to furnish Clocks superior to any made in the United States, both for accuracy of time-keeping and durability. They speak with confidence, from having tested their performance for several years. Ample opportunity will be afforded purchasers to test their qualities, and all clocks not proving satisfactory, when completed may be rejected. Astronomical Clocks made and warranted unsurpassed in their performance.

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"Mr. Byram is a rare mechanical genius."—[Journal of Com. 29 12eow*

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Pateutee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
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28 3m

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Scientific Museum.

Submarine boat in France.

The following account of a submarine steamboat brought before the citizens of Paris within the past few months, is an evidence that all things are not new that are stated to be novel, as will be observed by comparing the account with a communication published in last week's paper.

"Dr. Payerne, of Paris, has recently invented and brought before the public a curious submarine steamboat. It measures 27 feet in length and 9½ in width, and accomplishes the purposes for which it is intended, says M. Lamiral, by the following means:—1 Alimentation of vital air constantly made under the water, without any communication with the atmosphere above water. 2. Direct contact of the crew with the water at any depth down to 150 feet. 3. Slow or active locomotion of the boat under water. The alimentation of air is made by a double process, mechanical and chemical, which maintains, almost without expense, the air perfectly pure and respirable in all hermetical places, such as diving bells, submarine vessels, ship's holds, mines, &c. The direct contact with water is easily obtained by a pressure of air previously stored in special compartments of the boat and let out into the room, when the bottom of the vessel is to be thrown open, with a tension made sufficient to balance the column of water and the weight of the atmosphere above. A slow locomotion under water is necessary to accomplish various branches of industry, such as saving of wrecked goods, fishing for oysters, corals, spurge, pearls, &c. In these cases, when the submarine boat has dived down to the bottom, the crew work her as if preparing go up, pumping out the liquid ballast in order to to render the specific gravity of the submarine boat nearly equal to the weight of the bulk of water that she displaces. Then previously to the natural ascending impulse. which would take place, a couple of men having their feet on the ground and the upper part of their body inside the boat, take hold of her and walk easily towards the point wished for. This slow ambulation is quite sufficient in the above-mentioned works. A rapid locomotion, for travelling the boat under water and for contending against under currents, must be given by steam power. The apparent impossibility of maintaining fire under a furnace with a current of air is completely conquered by chemistry, in its pyrotechnical branch; a certain fuel is consumed in a hermetical furnace, and generates steam in the boilers. The machinery is worked quite as well as in any other screw steamer. This important attainment of Dr. Payernes cost him ten years of persevering study, the loss of his health and large sums of money. Eminent men of science have reported favorably on it, and the Minister of Public Work has appointed a Commissioner to investigate it."

Trial of a New Balloon at Paris.

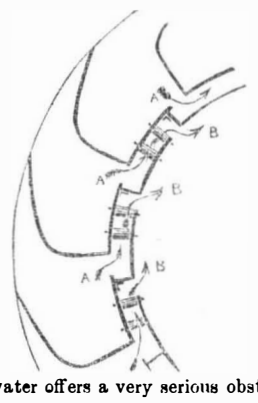
Galignani's Mesenger says it will be remembered that last summer great sensation was caused by the announcement that the means of navigating balloons had been discovered, and crowds flocked to the Hippodrome, where experiments were made. The balloon employed was in shape something like a fish, and beneath it was an apparatus on the clock-work principle, which propelled it by moving wings at the sides, and a sort of rudder at the tail kept it in the required direction. In some of the experiments public and private, the balloon was propelled in different directions, and against the wind, but the latter trials were not so successful. Since then the inventor, M. Jullien, a poor workman, has constructed a longer balloon, it is fifteen yards long; and on on Friday he succeeded in making it go several times from one end of the Hippodrome to the other against the wind. M. Jullien proposes to construct a much larger balloon if he can succeed in raising the funds, and he calculates that 20,000 francs would be necessary. He has passed nearly ten years in making the experiments which have led to the present result, and during that time suffered frightful misery. He would indeed, the *Presse* says, have died of hunger, if M. Arnault, the director of the Hippodrome, had not assisted him.

For the Scientific American.

Hydraulics.

(Continued from page 224.)

FIG. 39.



Back water offers a very serious obstruction to the Overshot Water Wheel, both by the filling of the descending bucket with back water, and the gathering of a considerable quantity of air therein. The remedy for removing the air, has been to bore holes in the "start" of the bucket. In wheels for low falls, made with open buckets, or straight float boards radiating from the centre, large openings were made in the sole planking, exclusive of the perforations in each bucket, to relieve them from the condensed air. At the present moment the practice in Britain (where water-wheels are found more economical than the steam engine, in some locations, although fuel is very cheap), is very different. In 1825 three iron water-wheels were constructed in Manchester, England, under the auspices of the celebrated Robertson Buchanan, for cotton factories in Scotland, one of which was for Mr. Smith, of Deanston (lately deceased), so well known in America. Each wheel was of 120 horse power, and at the present moment (1851) they are in successful operation and in good condition. The construction of these wheels twenty-five years ago, directed close attention, in Britain to the ingress and egress of water. The object was to prevent the condensation of the air, and to allow it to escape during the filling of the bucket; also its re-admission during the discharge of the water into the lower mill race. In 1826, a breast wheel had been erected at a place named the Linwood, in Scotland, a short distance from the natal place of Sir William Wallace, and it was found that when the wheel was loaded, and in flood waters, the buckets acted like water blasts, and forced the spray about 6 feet above the place where it entered. In order to remedy this defect openings were cut in the sole plates and small interior buckets were attached to the inner sole, as shown at B B B, fig. 39. The air in this case made its escape through the openings, A A A, into the inner bucket and passed upwards as shown by the arrows through B B B, into the interior of the wheel. By this means the buckets were effectually cleared of air while they were filling. The effect of this alteration gave an increase, of one-fourth of power to the wheel and it worked much better in flood water. It is now in operation, unaltered, and performs its duty satisfactorily.

Close bucket wheels labor under great difficulties, when receiving the water through the orifice at which the air escapes, and in some wheels the forms and construction of the buckets are such as almost entirely to prevent the entrance of the water, and thus deprive the wheel of at least one-third of its power. These defects may be easily accounted for where the water is discharged upon the wheel in a larger section than the opening between the buckets. Under such circumstances the air is suddenly condensed, and by its elastic force, it re-acts, and throws back the water, and the buckets pass without being half-filled. A common plan to relieve the buckets of air, has been to cut holes in the sole plates close to the back of the buckets, or else making the openings much wider in order to admit the water freely and allow the air to escape at the same time. All these remedies have been objectionable. Other remedies, such as circular tubes and boxes attached to the sole plates, and extending upwards into the interior, have been applied. The improvement of the breast wheel spoken of (fig. 39) directed attention in Great Britain to a proper system of ventilation, and Mr. Fairbairn, of Manchester, whose name, as an ingenious and scientific engineer, stands very high, has made very important improvements, a description of which will be given in our future papers.

Longitude of Savannah.

The telegraphic wires between Charleston and Savannah have recently been employed by the officers on the Coast Survey in ascertaining the difference of longitude of the two cities. They have erected a temporary observatory at the latter place, to which is attached a clock with Professor Locke's apparatus for breaking the circuit of the elertric fluid. The circuit is broken at each beat of the pendulum, which enables the observers at Charleston to hear the strokes of the seconds as distinctly as though they were by the side of the clock in Savannah. These beats are recorded by a register similar to that used in telegraphing. The transists of the stars as they pass the meridian of Charleston are noted on the register by another break in the electric circuit, which is made at the option of the observer, by pressing on a key fixed to the transit instrument. Accordingly, the paper which registers the passage of time by having second marks stamped on it by the clock, also gives evidence of the precise moment of a star's transit. The passage of the same star over the meridian is then noted by the observers at Savannah. The difference in time is the longitude between the two places.

India Cotton Crop.

The Bombay Telegraph and Courier reports that the cotton crop of the present season, from the cotton lands of Guzerat, is expected to produced 300,000 bales, being 100,000 bales more than was obtained last year. The quality also promises to be good, and the only measure necessary to give the produce its fair chance in the market, is to prevent the Ryots and shippers from adulterating the article. This requisite will, it is said, be secured by the severity with which the law on the subject has been carried out by Mr. Davies, the Collector of Broach.

Noble and Witty Reply.

In 1561, Philip I, sent the young Constable de Castile to Rome, to congratulate Sextus the Fifth on his advancement. The Pope immediately said—"Are there so few men in Spain that your king sends me one without a beard?" "Sir," said the fierce Spainard, "if his Majesty possessed the least idea that you imagined merit lay in a beard, he would have deputed a goat to you, not a gentleman."

Five Sundays in February in 1852.

We believe it will be found that there are five Sundays in February once in 28 years; and the next instance of this kind after 1852 will consequently be in 1880. This, however, will not be the case when the termination of a century occurs during the interval, owing to the dropping of the century leap year.

Dispatch in Ship-Building.

The "Glasgow Mail" gives an account of a screw steam ship named the "Arabian," of 700 tons burden; which, from the day her keel was laid down, until the day when she was ready to sail—with her engines and every thing in proper order, was only ten weeks. Her engines were put in by Mr. R. Napier. She is 200 feet long, 26 in breadth, the engines 130 horse power, and the screw 11 feet in diameter. This is "going a-head."

Dress.

Be either delicately pale or richly dark; beware of blue, red, and yellow—the favorites of savages, unless your red be deepened with black, or contrasted with green; your blue animated with orange; and your yellow illuminated with purple. Let the brilliant colors be small, like the lights in a picture; and the main body of the dress of a mixed color, or pure white, which is all colors. Beware of eclipsing yourself, by making your dress so beautiful that you will not be seen.

A round table top, of Amboyna wood, from China, six feet in diameter, has been received in Boston. It is believed that the tree from which the wood was obtained, must have girded at least thirty feet.

LITERARY NOTICES.

THE PHILOSOPHY OF SPIRITUAL INTERCOURSE—being an explanation of the modern mysteries of Andrew Jackson Davis. This publication has just been issued by the well-known publishers, Messrs. Fowlers & Wells, 131 Nassau street: mail edition 50 cents.

The author purports to lay bare to public comprehension the mysterious operations of the "evil spirits" which annoyed so extensively the reverend gentleman at Stratford last year, also the "Rochester Knocking" spirits, whose antics have so completely dumbfounded the sages and philosophers of the modern age. We read this work with the eager expectation of being at once made familiar with the pantheatic operations of ghosts and wizzards, from the time of the old Salem witchcraft down to the last and by far the most startling demonstrations. We had hoped that Mr. Davis, in his "superior condition," might succeed in solving all these mysterious agencies, and establish the relationship between past and present spirits, but we are disappointed; instead of "new light" we are more than ever mystified by the symbols and hieroglyphics introduced into Mr. Davis's philosophy. From what region he derives these figures, puzzles us more and more, and we incline to the opinion that the whole concoction is a gross species of deception and intrigue, designed to subserve selfish ends and spread false light among the people.

We regret that Mr. Davis, like many other modern prophets, has seen fit to throw over his publication the sacred drapery of religion. It is not strange, however, for it is a practice common among men, with sacrilegeous hands, to seize upon the apostolic keys of heaven, and appropriate them as tools for crafty knaves, to shut out virtue and unfold the gates which heaven has barred against the lust and avarice of ambition. The object is "not all divine," as we regard it, but serves to "turn the cup of undigested peace to wrath and bitterness." It is a popular way of sanctifying vice and spreading the seeds of transcendentalism among a class whose thoughts are readily turned from nobler influences. We do not intend by these strictures to condemn the publishers of this work, for we know them to be high-minded, honorable men, who seek only to enlighten mankind. We believe this to be the only work emanating from this source, ever issued by them, and our only regret is, that so available a position is afforded Mr. Davis to circulate his doctrine. That there is a class in our community who will always drink deep into the most absurd vagaries, and amongst whom better influences would only meet with scoffs and sneers, none can deny—to this class the writings of Mr. Davis should be confined.

JOURNAL OF THE FRANKLIN INSTITUTE.—This old and respectable journal still maintains a high character for the quality of the articles in its columns, and the great amount of information it contains. It is the oldest monthly magazine in the United States, devoted to Engineering and the Mechanic Arts. It is published at the Franklin Institute, Philadelphia.

DICTIONARY OF MECHANICS AND ENGINE WORK.—No. 26 of this able work, published by D. Appleton & Co., New York, contains articles on the Locomotive Engine and the Power Loom. It treats Mr. Bigelow's improvements on carpet looms at great length.

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